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They should be maps in which the various features of surface are clearly, carefully, and fully drawn. I do not mean maps full of names, but full of features. To illustrate : Where are the Alps ? The Alps are in Switzerland ; and the schoolboy finds on his map 'Alps' printed on the south side of that portion labelled 'Switzerland.' A good map would show at least four ranges there ; and proper maps of Austria, Italy, and France, would teach him that 'Alps' is a generic term with at least thirteen applications in southern Europe.

Norway and Sweden appear on most school-maps with but one or two rivers, because, I suppose, there is no long and large stream there important enough to have its name memorized ; but what an idea does such a map give of that country ? I can count over sixty rivers there on a map in Andree ; and enough of them should be drawn, even if without naming, to show the true character of the surface.

Similar instances could be given by the dozen. But I want to take up another point. When are we to see a geography with an index ? Studying geography by the topical method, an index is well-nigh indispensable. By any method, twice as effective work can be done if the material can be viewed from the stand-point of the kind of feature, production, occupation, or race, as well as in relation to this or that political subdivision.

I do not think it too much to insist on, that every ocean, sea, gulf, bay, strait, channel, lake, sound, harbor, canal, river, waterfall, bight, firth, bayou, roadstead, etc. ; every land feature, every product, occupation, language, religion, form of government, town and political division, — in short, every thing namable that has been mentioned in the text or appeared by name in the maps, — should be indexed by page or section, and, in case of map features, with latitude and longitude.

Why, even in Morden's 'Geography rectified,' published in 1693, there is a copious index, not to mention later works (1809, 1831) likewise favored.

With an index to aid him, a scholar can classify, compare, and infer ; and the value of the text-book would be doubled.

Nor would it be difficult to mention other ways in which our geographies could be improved. But if we can first have some better maps and an index worthy the name, we shall have gained much. I hope you will not be content with a few leaders. The matter is one of no slight importance. Perhaps, if our publishers read Prince Kropotkin's article in the December number of the *Nineteenth century*, they would be inspired to do better. Let us hope they will.

C. H. LEETE.

New York, Dec. 31.

#### The temperature of the moon.

Mr. Langley does not seem to have examined my condition for determining the moon's temperature with sufficient care. It is true that in the equation a moon of maximum radiating power was assumed ; but it had been first shown that the temperature of such a moon must be the same as that of any other, provided the relative radiating and absorbing powers are the same, as is usually assumed. The equation is between the absolute rate of radiation and absorption of heat, in which  $r$ , the relative radiating power, enters as a factor on the one side, and  $a$ , the relative absorbing power, on the other. If these are equal, of course they can be omitted, which is the

same as using unity as the relative radiating and absorbing powers, and so the same as assuming that the moon has a maximum relative radiating and absorbing power. The relative radiating and absorbing powers, and the proportion of heat reflected, do not, therefore, come into the condition at all. It cannot be said with propriety that the moon loses heat by reflection, as stated by Mr. Langley ; for the reflected heat has not been appropriated by absorption, and therefore cannot be said to be the moon's heat. It has come to the moon's surface and been rejected, and it has nothing to do with its temperature. The condition which determines the static temperature is, that the rate with which heat is radiated must be exactly equal to that with which it is absorbed. When this is the case, there can be neither increase nor decrease of temperature.

But perhaps this matter will be more readily comprehended by looking at it in a less mathematical way. We have a moon, say, with a surface of maximum relative radiating and absorbing power, and with a temperature below the static temperature corresponding to the rate with which it is receiving heat. With this temperature, the absolute rate with which the moon radiates heat is less than that with which it is receiving and absorbing it, and the difference goes toward raising the temperature of the body. But as the temperature increases, and with it the rate of radiating heat, though not proportionally, it after a time rises to that temperature at which the rate with which heat is radiated from the moon is exactly equal to that with which it is received and absorbed by it, and its temperature then remains stationary. This, expressed in a mathematical form, is the equation of condition.

But now suppose that the moon's surface is such that it radiates and absorbs heat at only half, or any other proportion, of the rate that one of maximum relative radiating and absorbing power does. Our condition is still satisfied ; for although the moon's surface now is radiating heat at a rate which is only half, or any other assumed proportion, of what it was before, it is also absorbing at only the same rate, whatever it may be, and there is no change of temperature needed to satisfy the condition of static temperature. Hence, so far as the static temperature of the moon is concerned, it is no matter what part of the heat received is absorbed, and what reflected ; these being complementary to each other, and both together equal to the heat radiated by a moon of maximum relative radiating power, under the condition of a static temperature. Of course, our condition for determining the temperature is not applicable where there is a rapid increase or decrease of temperature.

WM. FERREL.

Washington, Jan. 4.

#### Yankee.

In a paper upon the origin of 'Yankee Doodle,' read lately before the New York historical society, Mr. George H. Moore states that the word 'Yankee' is pure Dutch. 'Yankin,' he says, in the vocabulary of the early New York Dutch, meant 'to grumble, snarl, or yelp,' and its derivative noun meant 'a howling cur.'

But where did the New York Dutch get the word ? I think from the Indians. Peter Martyr says that Sebastian Cabot named the coasts of Newfoundland and thereabouts the land of bacalaos, because in the seas he found a multitude of large fish which